which the FCC is tasked with ensuring access to effective and efficient communications technologies and services, makes this request even more compelling.

F. Waiver Relief Can Be Narrowly Tailored.

Because of the unique operational requirements associated with use of the Two-Way Wireless Headsets at nuclear power plants, waiver relief can be narrowly tailored. Specifically, Petitioners request that the allocation and licensing provisions of Parts 2 and 90 of the FCC's Rules be waived to permit "Power Licensees," as defined in Section 90.7 of the FCC's Rules,[36] to obtain licenses under Part 90 for Two-Way Wireless Headsets operating in the frequency bands 150.0-150.8 MHz; 150.8-157.0375 MHz; 157.0075-157.2175 MHz; 157.1875-162.0125 MHz; 162.0125-173.200 MHz; 173.200-173.400 MHz; 173.400-174.00 MHz; 174.00-216.00MHz; 470.00-608.00MHz; 614.00-806.00MHz; and 796.00-868.00 MHz, subject to the following conditions:

1. Licensing under this blanket waiver will be limited to Power Licensees that own or operate nuclear power plants, or that provide a supporting service to a nuclear plant owned or operated by the licensee's parent corporation, another subsidiary of the same parent, or the licensee's own subsidiary.[37]

2. The use of the Two-Way Wireless Headsets will be restricted to indoor locations at the nuclear power plants.

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[36] "Power Licensees" include persons primarily engaged in "(1) the generation, transmission, or distribution of electrical energy for use by the general public or by the members of a cooperative organization," as well as persons engaged in "(4) The providing of a supporting service by a corporation directly related to activities of its parent corporation, or another subsidiary of the same parent, or of its own subsidiary, where the party served is regularly engaged in any of the activities set forth in this definition."

[37] The Petitioners suggest that upon grant of the blanket waiver requested herein, each Power Licensee would submit its own application for licensing, under Part 90, of the Two-Way Wireless Headsets used at the relevant nuclear power plant(s). Petitioners suggest that each application should include all relevant technical information as to the frequency bands to be used and the plant locations. Although each application would indicate that a waiver was being requested, the waiver request could simply make reference to the FCC's grant of a blanket waiver for such licensing, thereby allowing routine processing by the FCC's licensing staff. Although Petitioners are requesting a general waiver of Part 90, they note that certain provisions of Part 90 should be deemed inapplicable in any event; for example, Section 90.35(b) on the frequencies normally available to Industrial/Business licensees; Section 90.175 on frequency coordination in the Part 90 radio services; Section 90.203 on certification of transmitters to be used under Part 90; and Section 90.425 on station identification.

3. A license for mobile operation may specify use within a radius of a set of geographic coordinates on the plant property.

4. The Two-Way Wireless Headset transmitting equipment must be of a type which has been certificated for operation as a low power auxiliary station under Subpart H of FCC Rule Part 74.[38]

Petitioners believe that these conditions will effectively limit the relief requested herein to the nuclear power plants, and will thereby ensure that this equipment is used in a manner that will pose no threat of interference to other licensed users.

[38] 47 C.F.R. § 74.801 *et seq.*

For the foregoing reasons, Petitioners request a Waiver of Parts 2 and 90 of the Commission's Rules to permit Power Licensees to continue to operate the Two-Way Wireless Headsets on nuclear plant sites for indoor operations as proposed herein.

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Dated: July 15, 2009

ATTACHMENT A

SPECIAL SYSTEM SERVICES

1 Wayne Circle
Lower Gwynedd, PA
19002

Office (215) 699-4427
FAX (215) 699-4427

March 3, 2005

Federal Communications Commission
Wireless Telecommunications Bureau
1270 Fairfield Road
Gettysburg, PA 17325

To Whom It May Concern:

On March 02, 2005 the Exelon Generation Company conducted tests on the Telex model BTR-700 (Base unit) and the TR-700 (Head set unit) at the Limerick Nuclear plant in Limerick, PA. The purpose of the testing was to identify the range of the units and to verify the proximity of the plant parimeter to any possible entity that may be subject to interference.

The units operate at a maximum of 50 mw of output power. The base unit was set up outside on a table, free of obstructions, on the Limerick Nuclear plant property. A Hewlett Packerd Spectrum analyzer was set up in a van with a magnetic mount antenna on the roof (about 6 feet above the ground). We first tested the base unit at intervals of 0.1 miles until signal was lost. We then repeated the test with the headset. This time the Spectrum analyzer was placed on the table with the base and the headset signal strength was measured as we drove away. The head set antennas were placed on the outside of the van window, toward the test location. There were no obstructions between the base and the van during the testing.

Test results:

Distance		Frequency 522.3 MHz Base Signal strength		Frequency 632.7 MHz Headset Signal strength	
(ft.)	(meters)	(dBm)	(uv/m)	(dBm)	(uv/m)
10	3.048	-40	2236.067	-50	707.106
528	160.9	-80	22.36	-90	7.071
1056	321.9	-100	2.236	-100	2.236
1584	482.8	-105	1.2571	-108	0.89
2112	643.7	-110	0.707	-114	0.446

Conclusion :

The signal strength from the base and headset decreases to the noise level of between -110 and –114 dBm where communications is lost between units. This occurs at a distance of about 2000 feet. No homes or businesses are located within a 2000 foot parimeter of the plant property boundry. Any communications within the plant or even within the plant boundry would not produce a signal strength which could be heard outside the plant property. Tests within the plant were cancelled because every building would further attenuate the signal by between 10 and 20 dBm and we loose signal from the parimeter test position before we reach the plant buildings.

The full duplex headsets are essential to the safety and support of the plant activities and none of the operations has been the subject of interference complaints.

Respectfully,

T. Fred Short, Electrical Engineer and Consultant for Exelon

DECLARATION

I, T. Fred Short, am an Electrical Engineer at Special System Services ("SSS"), 1 Wayne Circle, Lower Gwynedd, PA 19002. SSS serves as a Consultant for Exelon, a nuclear plant owner that utilizes Telex equipment for certain communications needs. I hereby declare the following to be true under the penalty of perjury.

1. I am the author of the SSS letter dated March 3, 2005 (the "Letter") which the Nuclear Energy Institute submitted to the FCC as part of its request for waiver, in which I described the real-world testing of Telex equipment's signal strength when operated at and around nuclear plant buildings.

2. As a consequence of the testing described in the Letter, I am familiar with both the signal strength and the attenuation characteristics of the Telex equipment, in the context of a nuclear plant.

3. I am also familiar with the types of buildings that generally house training centers used by nuclear plants. Inside these training centers are the simulators that are used to train plant staff on the use of equipment, including the Telex equipment.

4. Based upon my knowledge and expertise, including the information obtained during the testing described in the Letter, the signal strength of Telex equipment, operated at 50 mw of output power inside a plant training center, would be reduced to one-quarter of its non-obstructed path strength as it passes through the building wall, to the outdoors. Accordingly, the signal from the base station and headset operated inside a training center would travel no further than 500 feet outside of the building, from the point nearest the Telex equipment operation.

Respectfully submitted,

T. Fred Short 09/09/05
Electrical Engineer
Consultant for Exelon

ATTACHMENT B

"EQUIPMENT ALTERNATIVES" - BY CATEGORY

Based on our research, we see six (6) different categories of communications equipment used widely, in one way or another, throughout the Nuclear Energy Industry ("Industry") facilities in the U.S. for outage and maintenance work in areas where worker exposure to radiation is an issue:

1. VoIP Systems, based on a 802.11 platform (2.4 GHz, non-spread spectrum);
2. Part 90 UHF/walkie-talkies (two-way radios);
3. Private Cell Phone Systems;
4. Wired Telephone Service;
5. 2.4 GHz spread spectrum products;
6. Wireless headsets.

Comments from Industry plant operators and managers demonstrate that none of these "alternatives" can fully replace Telex as a means of achieving reliable, wireless, fully duplex communications necessary for key operating functions in the plants. While Telex is used in the plants, in many different ways, it is most essential in the context of communicating during outage and maintenance situations, when cranes and bridges are moving radiated fuel and spent fuel rods from one part of the plant to another.

Below are all of the quotes (minus the brand names which have been redacted in order to avoid any business tort exposure) from nuclear plant operators and managers in the responses to the NEI questionnaire, which solicited information about the various communications equipment they use, in addition to Telex, or have tested.

1. VoIP/2.4 GHz (non-spread spectrum):

   - "Due to the RF propagation characteristics of the 2.4 GHz frequency spectrum, it is very difficult to achieve nearly ubiquitous RF coverage within containment that is required for predictable and reliable communications using VoIP equipment."
   - "To achieve a coverage footprint within containment similar to Telex, a higher density of VoIP transceiver equipment would be required in high radiation areas, such as inside the bio-shield wall. This would result in additional radiological dose exposure to employees responsible for implementing the engineering design change for a new wireless communications system, installing the transceiver equipment at the beginning of each outage, and performing maintenance on cabling and/or transceivers in the event of a malfunction during the outage."
   - "The VOIP wireless phone system, unlike Telex equipment, is unable to automatically re-establish full-duplex communications without any user action if a user were to momentarily leave and then subsequently re-enter the coverage area. If personnel using the VOIP wireless phone system lose communications due to a momentary loss of

coverage, they must take manual actions to initiate a call and re-establish communications." "This auto-reconnect functionality is vital for the safety of personnel working in high radiation area and other high risk work evolutions where they could be encumbered by protective clothing or equipment they must carry into and out of the work area. The inability to auto-reconnect in a high radiation area could result in additional and unanticipated radiological dose exposure."

- Problems with VoIP phones included the fact that "the equipment operates at 2.4 GHz and has problems with multi-path. Requires the user to hold the phone while in operation. Displays are hard to read in dim light. Noise canceling microphones were not used and background noise and interference was a problem. Battery time limited to about 4 hours of continuous talk time."

- "The VoIP phone was good but would not stay on frequency; antenna's broke very easily; not intended for construction use; no longer supported."

- "The number of VoIP phones usable in containment at one time in a given area may be somewhat limited."

- "Main problem is that these phones drop calls when losing signal or swapping between repeater antennas."

- Problems include: "possible denial of access if cell is full (each cell handles 8 calls at one time); possible call drop due to weak coverage; both denial of access and dropped calls require human intervention in-order to reestablish communications; limited range in the turbine buildings, the diesel building, and the offgas building due to the lack of slotted coax for RF propagation in these areas."

2. <u>Part 90 UHF/Walkie-Talkies</u>:

- Negatives noted included "Push to Talk (PTT) radios require user to use one hand to initiate conversations; Poor fidelity in noisy areas; No bridging capability; 4 watt transmitter is a potential source of Radio Frequency Interference (RFI)."

- Uses hand held radios but states that they are "hard to hear in noisy areas. Have to use noise-canceling headsets, provide by manufacturer to attach to radios. These headsets do not eliminate all background noise, still hard to hear in some areas."

- "Hand held radio has an output of 1 watt, which is enough to actuate sensitive instruments if radio is keyed close to instruments."

- "Hand held radios have output of 1 watt this output is strong enough to actuate sensitive equipment. Example: Diesel driven cooling water pumps, when radio was keyed next to diesel it caused overspeed of the diesel."

- "Two-way radios can be used in restricted area but it has dead spots inside the plant and excessive background noise. This equipment "essentially does not meet many of the 12 Telex performance criteria."

- "This equipment could cause workers to spend longer periods in high radiation areas due to not being full-duplex. No central management of the frequencies or intercom groups. No way to patch auxiliary inputs into groups."

- 450 MHz UHF Trunking Radio were ranked fairly high, but noted negatives of "calls getting dropped and lack of background noise rejection." "The radio system is half duplex only."

- Problems include: "there is no hands-free operation feature, which requires the user to key microphone whenever they need to talk. It is a half-duplex system only and the base station only allows one channel operation, which restricts interconnect of multiple systems. High background noise reduces the clarity of communications. Sub-optimal coverage characteristics. The equipment is less durable than Telex headsets and were easily broken if dropped. Breakage of the antennas was common. Size, weight and design of equipment prevented the use of personnel safety equipment (hardhats could not be worn with the units)."

- "The two-way radio system is half-duplex only with a limit of only one person being able to talk at a time, which causes one talker to blank out all others. There is limited coverage within containment when communicating point-to-point using portable radios. The limited background noise rejection of the radio equipment reduces the clarity of communications in high noise areas."

- "Problem is multi-channel cross talk."

- "There is a slight setup delay before communication can commence due to trunking channel assignment. This type of issue can be problematic for crane operations due to delay."

- "Two-way radios are not full duplex, therefore they can't integrate with vendor systems that are normally full duplex Telex type systems."

- "Extremely expensive ($3K per unit) and does not operate full duplex (a must for many maintenance activities)."

- "A trip (actuation) was attributed to activation of a 450 MHz radio many years ago, prior to the creation of radio exclusion zones."

- "Not powerful enough to transmit through the secondary containment wall but works well outside."

- 450, 800, 900 radio systems installed for site operations. Negatives noted: "not hands free; not duplex; poor audio quality; not easy to use, etc."

- Uses trunked radio system but does not like it because "it is not duplex."

- The walkie-talkie equipment is "not good for safety situations."

- "Equipment (walkie-talkies) is not dedicated and therefore any other radio operator can join the channel and disrupt communications."

3. Private Cell Phone Systems:

- Problems identified included: "Multi-user capability required - each user had a separate phone number assigned. Cell sites had limited coverage capabilities due to the design of the system, the operating system frequency and the design characteristics of the containment structure. Cell site loading resulted in dropped calls or in the inability to make calls. Multiple cell sites had to be installed to achieve minimal coverage resulting in increased radiological exposure to the workers installing the system in high radiation areas."

- "Restricted to use outside of high noise areas due to limited background noise rejection capability. Easily broken. Not simple to use since each phone had an assigned number and dynamic lists had to be maintained to track who was assigned a particular phone."

- "Could only talk to one user at a time. Phone was difficult to use while wearing protective clothing."

- "Equipment was packaged poorly and did not stand up to the physical abuse it was subjected to in the Containment environment. RF design was poor and channel frequency drift was common resulting in poor communications. Units were difficult to adjust because RF adjustments needed to be performed in a RF screen room which was not available on site. Frequent shipments of equipment were made to the vendor for simple RF adjustments. This system was abandoned and replaced by Telex."

- Problems with system: "difficult to setup, balance and maintain in Rx. Bldg due to placement of antennae system and to get the communication outside of the Rx Bldg. The durability of the headsets, antennas, etc is not as good as the TELEX belt packs. The system does not integrate with our Audio Matrix. The system cannot be used where you depend on good, constant communications." (Operator no longer uses this equipment.)

- "These require noise-canceling headsets to be effective in some parts of the Plant."

- "Will not interact with Matrix. Affective range determined by antenna placement. Background noise problems resolved by modification. Not highly effective due to structures and configuration."

- "The mini cell system is designed and intended to augment the existing telephone system by adding the features of mobility. Users can still get busy signals when attempting to contact other users. Coverage is subject to installed antennas through the plants. This

system functions the same way a normal cell system does and is subject to the same limitations."

- "In high use areas, users may be denied access due to the limited number of concurrent users allowed to access a single antenna. The handsets do not adapt to high noise conditions or the hands free use."

- "Limited range, static problems, very complicated set up. The system was used during a refueling outage in the 1990's and abandoned during the outage due to lack of functionality."

- Negative comments for "lack of high fidelity/clarity; multi-user; uninterrupted voice transmissions; moisture resistant and durability." Additional problems noted on these systems were "few frequencies available," and "not programmable."

- "There is some drop associated with our cell phones, and re-establishing communications is difficult when the phone is under protective clothing for bagged. The time it takes to re-establish communications had a dose cost in High Radiation Areas."

4. Wired Telephone Service:

- Uses hard-wired communications equipment, for which "the only drawback is it is not wireless."

- "Problem is a hardwire system adversely impacts ALARA. A hardwire system requires installation of approximately 1000 ft of cable for a typical routine outage to support eddy current and reactor coolant pump job coverage. Technicians incur dose during cable installation and un-installation."

- "A hard wire system adversely impacts industrial safety. Personnel must climb over and around equipment to install (and uninstall) the cable. Also, the cable creates a trip hazard when in use."

5. 2.4 GHz Spread Spectrum:

- "We use Telex because multiple channels are necessary to allow more work crews to communicate with each other in high noise/high radiation areas at the same time. Telex's communication equipment does not interfere with existing wireless dosimetry equipment, wireless LAN access points or wireless video used for refueling cameras. Telex actually allows for several channels to be in use simultaneously. Telex operates in a spectrum outside of the 2.4Ghz range where the other equipment operates. This prevents interference between the systems."

- "The problem noted with the 2.4 GHz spread spectrum equipment is that it uses same frequency band as the wireless dosimetry, LAN and video equipment already in use at the plant. There are concerns over interference between the different equipment in places where all of it must be operational (e.g. Refuel Floor)."

- "Radiological safety is enhanced with the ability to communicate with workers in the field while being able to view remote dose and dose rate information from a central monitoring station. The ability to communicate with the worker to reposition their body or to move to a different location saves personnel radiation exposure."

- "Due to construction of Nuclear power plant containment buildings (limited space with stainless steel liner), signals tend to bounce and cause multi-path interference. Higher frequencies seem to be more susceptible."

- Also tested 2.4 GHz spread spectrum phones; graded it highly but stated: "A system was presented with no applications at this time."

- "The radios are untested in an outage environment."

6. Wireless Headsets:

- Problems noted include "tethered headset limits mobility; low audio volume – no volume adjustment; susceptible to background noise."

- Tested wireless headsets and found that "they were not durable. Also, equipment was used for crane operations until the voice drop out (due to lack of full duplex) caused problems for the crane operator."

ATTACHMENT C

Summary of 2008 Survey of Nuclear Plant Telex Headset Use

Below are the results of the plant survey undertaken by NEI, in cooperation with the UTC during the spring/summer of 2008.

Roughly half of the plants have responded to the survey and approximately 10 plants have tested non-Telex equipment. As was the case with the 2005 survey, the plants report a myriad of shortcomings in the equipment they tested as potential alternatives to the Telex Equipment. Among the most common complaints about the non-Telex equipment were (i) interference caused to certain other plant equipment and systems; the coverage area is smaller (and thus not as useful); and the small number of headsets can be used at the same time (and thus not as useful).

A summary of the results is below including a separate section listing the plants' comments regarding their use of non-Telex equipment:

Results Summary

- 47 of 108 plants responded to the survey.
- No plants are using BTR 600 radios.
- Most plants are using BTR 800, 700 or 200 series equipment.
  a) 36 plants are using BTR 800 radios; 10 plants are using 1 to 4 radios, 12 plants are using 5 to 10 radios, and 12 plants are using more than 10 radios
  b) 26 plants are using BTR 700 radios; 10 plants are using 1 to 4 radios, 4 plants are using 5 to 10 radios, and 12 plants are using more than 10 radios
  c) 20 plants are using Telex BTR 200 equipment; 12 plants are using 1 to 4 radios, 4 plants are using 5 to 10 radios, and 7 plants are using more than 10 radios
  d) 16 plants are using BTR 300 radios; 7 plants are using 1 to 4 radios, 6 plants are using 5 to 10 radios, and 3 plants are using more than 10 radios
- In the last two years, 26 plants bought more Telex equipment and 10 plants purchased and tested non-Telex equipment.
- The plants reported that they tested five additional potential equipment alternatives (all wireless). For the purposes of this report which will be submitted to the FCC, so as to avoid any issue of commercial disparagement, we shall replace the names of the equipment tested with numbers, 1-5. As each type of equipment is referenced herein, once again numbers, rather than names, shall be utilized.
- Generally, the plants noted that the equipment provided unacceptable voice quality and coverage; caused unacceptable interference to other wireless devices and networks; and does not permit the use of enough headsets at the same time.
- 32 plants use Telex equipment indoors only and 10 plants use Telex equipment indoors and outdoors.

- Telex equipment is used during outages only by 23 plants, 2-3 times per month by 13 plants, 1-2 times per week by 4 plants, and daily by 1 plant.
- 18 plants reported contacting SBE regarding frequency coordination, 12 successfully completed frequency coordination and 6 received no response from SBE.
- Dosimeter interference was reported by 7 plants that tested Alternative #2 and #4 equipment but 16 plants reported no interference.

Specific Comments Regarding Problems/Challenges of Using Non-Telex Equipment

As detailed below in the comments received from the plants, the two primary problems with non-Telex equipment are limited range of use and interference to plant operations.

Capacity and Coverage Problems

a) Plant Vogtle, Farley and Hatch, Southern Company; Georgia Power and Alabama Power: Refueling activities require full duplex, immediate response communications that cannot be achieved with push to talk equipment. Other full duplex equipment that has been investigated has capacity limitations with associated access points. Equipment operating at frequencies above 700 MHz do not provide the coverage necessary.

b) Palo Verde Nuclear Generating Station, Arizona Public Service: The durability and flexibility does not match the TELEX. Also, the non-TELEX units cannot operate enough units at one time.

c) Davis Besse Nuclear Power Station, First Energy; Fermi 2, DTE Energy / Detroit Edison; River Bend Station, Entergy; and Salem/Hope Creek, PSEG: Lack of range, sound quality, and multipath issues due to 2.4 GHz.

d) Waterford 3, Entergy: Alternative #1 headsets do not have noise reduction microphones.

e) Surry, Virginia Electric and Power Company: Alternative #4 equipment provided 80% coverage in containment and Alternative #2 provided 95% coverage in containment. While Alternative #2 provided the best coverage at Surry, the operating frequency of 2.4 GHz is used by other plant devices so this may not be a viable replacement for the Telex equipment. Also, Alternative #2 is limited to 4 belt packs for full duplex operation.

f) Millstone, Dominion Nuclear Connecticut, Inc.: Alternative #4 equipment provided less than 40% coverage in containment and Alternative #2 provided approximately 60% coverage in containment. Test results indicated that Alternative #4 and Alternative #2 did not provide adequate coverage for refueling operations.

g) Sequoyah Nuclear Plant, Tennessee Valley Authority: We have not been able to obtain the coverage areas that we currently have with the Telex equipment.

h) Perry Nuclear Power Station, FENOC: The most significant draw back for non-Telex equipment is the inability to deploy an antenna system to provide adequate reception coverage to support various work groups on independent channels.

i) Kewaunee, Dominion Energy Kewaunee, Inc.: Alternative #4 provided less than 10% coverage in containment and Alternative #2 provided approximately 40% coverage in

containment. Test results indicated that Alternative #4 and Alternative #2 did not provide adequate coverage for refueling operations.

- **Interference Issues**

  a) Kewaunee Power Station, Dominion: Alternative #4 has signal issues (e.g. interference) in buildings with round ceilings.

  b) Callaway Nuclear Plant, Ameren UE: Non-Telex equipment is not compatible with a digital audio matrix and causes interference to other 1.9 or 2.4 GHz equipment.

  c) Exelon: With Alternative #2 (2.4 GHz system) and operating in 802.11, we had interference with other technologies which using this standard 802.11, such as wireless data network and other systems used during refuel outages, and did no formal testing. We did test Alternative #4's 10 Digital Wireless Intercom 1.92 GHZ to 1.93 GHZ frequency bands in November of 2007. The system appeared to be very flexible, but there was a critical failure in the containment dome at the station tested. Given the structure of the dome, we found 100% packet loss for the digital signal. A frequency engineer from Alternative #4 was called upon to support the testing, but could not address the issue. We are not optimistic that we will be successful in finding an alternative for a wireless intercom solution which can be effectively used in the plant environment at our stations. A long-term alternative would be to move to an in-plant communications system, which leverages voice over IP. Moving in this direction will take time and is expensive, as well as may not be technically feasible in some areas of the plant environment.

  d) Prairie Island Nuclear Generating Plant, Xcel Energy: Interference with sensitive instrumentation, unable to cope with high-noise environment, are all issues with non-Telex equipment

  e) Wolf Creek Generating Station, Wolf Creek Nuclear Operating Corporation: Non-Telex equipment will not work on refueling floor or in reactor head area due to multipath distortion from reflections from containment dome.

  f) Harris Nuclear Station, Progress Energy: Frequency of non-Telex equipment does not work well in containment.

  g) Naesco: Non-Telex equipment limited on number of users and unacceptable interference.

ATTACHMENT D

ATTACHMENT D

List of Power Nuclear Reactors

http://www.nrc.gov/reactors/operating/list-power-reactor-units.html

Plant Name Docket Number	Reactor Type	Location	Owner/Operator	NRC Region
Arkansas Nuclear 1 05000313	PWR	6 MI WNW of Russellville, AR	Entergy Nuclear Operations, Inc.	4
Arkansas Nuclear 2 05000368	PWR	6 MI WNW of Russellville, AR	Entergy Nuclear Operations, Inc.	4
Beaver Valley 1 05000334	PWR	17 MI W of McCandless, PA	FirstEnergy Nuclear Operating Co.	1
Beaver Valley 2 05000412	PWR	17 MI W of McCandless, PA	FirstEnergy Nuclear Operating Co.	1
Braidwood 1 05000456	PWR	24 MI SSW of Joilet, IL	Exelon Generation Co., LLC	3
Braidwood 2 05000457	PWR	24 MI SSW of Joilet, IL	Exelon Generation Co., LLC	3
Browns Ferry 1 05000259	BWR	10 MI NW of Decatur, AL	Tennessee Valley Authority	2
Browns Ferry 2 05000260	BWR	10 MI NW of Decatur, AL	Tennessee Valley Authority	2
Browns Ferry 3 05000296	BWR	10 MI NW of Decatur, AL	Tennessee Valley Authority	2
Brunswick 1 05000325	BWR	2 MI N of Southport, NC	Progress Energy	2
Brunswick 2 05000324	BWR	2 MI N of Southport, NC	Progress Energy	2
Byron 1 05000454	PWR	17 MI SW of Rockford, IL	Exelon Generation Co., LLC	3
Byron 2 05000455	PWR	17 MI SW of Rockford, IL	Exelon Generation Co., LLC	3
Callaway 05000483	PWR	10 MI SE of Fulton, MO	Ameren UE	4
Calvert Cliffs 1 05000317	PWR	40 MI S of Annapolis, MD	Constellation Energy	1
Calvert Cliffs 2	PWR	40 MI S of Annapolis, MD	Constellation Energy	1

Plant Name Docket Number	Reactor Type	Location	Owner/Operator	NRC Region
05000318				
Catawba 1 05000413	PWR	6 MI NW of Rock Hill, SC	Duke Energy Power Company, LLC	2
Catawba 2 05000414	PWR	6 MI NW of Rock Hill, SC	Duke Energy Power Company, LLC	2
Clinton 05000461	BWR	6 MI E of Clinton, IL	Exelon Generation Co., LLC	3
Columbia Generating Station 05000397	BWR	12 MI NW of Richland, WA	Energy Northwest	4
Comanche Peak 1 05000445	PWR	4 MI N of Glen Rose, TX	TXU Generating Company LP	4
Comanche Peak 2 05000446	PWR	4 MI N of Glen Rose, TX	TXU Generating Company LP	4
Cooper 05000298	BWR	23 MI S of Nebraska City, NE	Nebraska Public Power District	4
Crystal River 3 05000302	PWR	7 MI NW of Crystal River, FL	Progress Energy	2
D.C. Cook 1 05000315	PWR	11 MI S of Benton Harbor, MI	Indiana/Michigan Power Co.	3
D.C. Cook 2 05000316	PWR	11 MI S of Benton Harbor, MI	IndianaMichigan Power Co.	3
Davis-Besse 05000346	PWR	21 MI ESE of Toledo, OH	FirstEnergy Nuclear Operating Co.	3
Diablo Canyon 1 05000275	PWR	12 MI WSW of San Luis Obispo, CA	Pacific Gas & Electric Co.	4
Diablo Canyon 2 05000323	PWR	12 MI WSW of San Luis Obispo, CA	Pacific Gas & Electric Co.	4
Dresden 2 05000237	BWR	9 MI E of Morris, IL	Exelon Generation Co., LLC	3
Dresden 3 05000249	BWR	9 MI E of Morris, IL	Exelon Generation Co., LLC	3
Duane Arnold 05000331	BWR	8 MI NW of Cedar Rapids, IA	Florida Power & Light Co.	3
Farley 1	PWR	18 MI SE of Dothan, AL	Southern Nuclear	2

Plant Name Docket Number	Reactor Type	Location	Owner/Operator	NRC Region
05000348			Operating Co.	
Farley 2 05000364	PWR	18 MI SE of Dothan, AL	Southern Nuclear Operating Co.	2
Fermi 2 05000341	BWR	25 MI NE of Toledo, OH	Detroit Edison Co.	3
FitzPatrick 05000333	BWR	8 MI NE of Oswego, NY	Entergy Nuclear Operations, Inc.	1
Fort Calhoun 05000285	PWR	19 MI N of Omaha, NE	Omaha Public Power District	4
Ginna 05000244	PWR	20 MI NE of Rochester, NY	Constellation Energy	1
Grand Gulf 1 05000416	BWR	25 MI S of Vicksburg, MS	Entergy Nuclear Operations, Inc.	4
Hatch 1 05000321	BWR	11 MI N of Baxley, GA	Southern Nuclear Operating Co., Inc.	2
Hatch 2 05000366	BWR	11 MI N of Baxley, GA	Southern Nuclear Operating Co., Inc.	2
Hope Creek 1 05000354	BWR	18 MI SE of Wilmington, DE	PSE&G Nuclear	1
Indian Point 2 05000247	PWR	24 MI N of New York City, NY	Entergy Nuclear Operations, Inc.	1
Indian Point 3 05000286	PWR	24 MI N of New York City, NY	Entergy Nuclear Operations, Inc.	1
Kewaunee 05000305	PWR	27 MI E of Green Bay, WI	Dominion Generation	3
La Salle 1 05000373	BWR	11 MI SE of Ottawa, IL	Exelon Generation Co., LLC	3
La Salle 2 05000374	BWR	11 MI SE of Ottawa, IL	Exelon Generation Co., LLC	3
Limerick 1 05000352	BWR	21 MI NW of Philadelphia, PA	Exelon Generation Co., LLC	1
Limerick 2 05000353	BWR	21 MI NW of Philadelphia, PA	Exelon Generation Co., LLC	1
McGuire 1 05000369	PWR	17 MI N of Charlotte, NC	Duke Energy Power Company, LLC	2

Plant Name Docket Number	Reactor Type	Location	Owner/Operator	NRC Region
McGuire 2 05000370	PWR	17 MI N of Charlotte, NC	Duke Energy Power Company, LLC	2
Millstone 2 05000336	PWR	3.2 MI WSW of New London, CT	Dominion Generation	1
Millstone 3 05000423	PWR	3.2 MI WSW of New London, CT	Dominion Generation	1
Monticello 05000263	BWR	30 MI NW of Minneapolis, MN	Nuclear Management Co.	3
Nine Mile Point 1 05000220	BWR	6 MI NE of Oswego, NY	Constellation Energy	1
Nine Mile Point 2 05000410	BWR	6 MI NE of Oswego, NY	Constellation Energy	1
North Anna 1 05000338	PWR	40 MI NW of Richmond, VA	Dominion Generation	2
North Anna 2 05000339	PWR	40 MI NW of Richmond, VA	Dominion Generation	2
Oconee 1 05000269	PWR	30 MI W of Greenville, SC	Duke Energy Power Company, LLC	2
Oconee 2 05000270	PWR	30 MI W of Greenville, SC	Duke Energy Power Company, LLC	2
Oconee 3 05000287	PWR	30 MI W of Greenville, SC	Duke Energy Power Company, LLC	2
Oyster Creek 05000219	BWR	9 MI S of Toms River, NJ	Exelon Generation Co., LLC	1
Palisades 05000255	PWR	5 MI S of South Haven, MI	Entergy Nuclear Operations, Inc.	3
Palo Verde 1 05000528	PWR	36 MI W of Phoenix, AZ	Arizona Public Service Co.	4
Palo Verde 2 05000529	PWR	36 MI W of Phoenix, AZ	Arizona Public Service Co.	4
Palo Verde 3 05000530	PWR	36 MI W of Phoenix, AZ	Arizona Public Service Co.	4
Peach Bottom 2 05000277	BWR	17.9 MI S of Lancaster, PA	Exelon Generation Co., LLC	1
Peach Bottom 3	BWR	17.9 MI S of Lancaster, PA	Exelon Generation Co.,	1

Plant Name Docket Number	Reactor Type	Location	Owner/Operator	NRC Region
05000278			LLC	
Perry 1 05000440	BWR	7 MI NE of Painesville, OH	FirstEnergy Nuclear Operating Co.	3
Pilgrim 1 05000293	BWR	4 MI SE of Plymouth, MA	Entergy Nuclear Operations, Inc.	1
Point Beach 1 05000266	PWR	13 MI NNW of Manitowoc, WI	FPL Energy Point Beach, LLC	3
Point Beach 2 05000301	PWR	13 MI NNW of Manitowoc, WI	FPL Energy Point Beach, LLC	3
Prairie Island 1 05000282	PWR	28 MI SE of Minneapolis, MN	Nuclear Management Co.	3
Prairie Island 2 05000306	PWR	28 MI SE of Minneapolis, MN	Nuclear Management Co.	3
Quad Cities 1 05000254	BWR	20 MI NE of Moline, IL	Exelon Generation Co., LLC	3
Quad Cities 2 05000265	BWR	20 MI NE of Moline, IL	Exelon Generation Co., LLC	3
River Bend 1 05000458	BWR	24 MI NNW of Baton Rouge, LA	Entergy Nuclear Operations, Inc.	4
Robinson 2 05000261	PWR	26 MI from Florence, SC	Progress Energy	2
Saint Lucie 1 05000335	PWR	12 MI SE of Ft. Pierce, FL	Florida Power & Light Co.	2
Saint Lucie 2 05000389	PWR	12 MI SE of Ft. Pierce, FL	Florida Power & Light Co.	2
Salem 1 05000272	PWR	18 MI S of Wilmington, DE	PSE&G Nuclear	1
Salem 2 05000311	PWR	18 MI S of Wilmington, DE	PSE&G Nuclear	1
San Onofre 2 05000361	PWR	4 MI SE of San Clemente, CA	Southern California Edison Co.	4
San Onofre 3 05000362	PWR	4 MI SE of San Clemente, CA	Southern California Edison Co.	4
Seabrook 1 05000443	PWR	13 MI S of Portsmouth, NH	Florida Power & Light Co.	1

Plant Name Docket Number	Reactor Type	Location	Owner/Operator	NRC Region
Sequoyah 1 05000327	PWR	9.5 MI NE of Chattanooga, TN	Tennessee Valley Authority	2
Sequoyah 2 05000328	PWR	9.5 MI NE of Chattanooga, TN	Tennessee Valley Authority	2
Shearon Harris 1 05000400	PWR	20 MI SW of Raleigh, NC	Progress Energy	2
South Texas 1 05000498	PWR	12 MI SSW of Bay City, TX	STP Nuclear Operating Co.	4
South Texas 2 05000499	PWR	12 MI SSW of Bay City, TX	STP Nuclear Operating Co.	4
Summer 05000395	PWR	26 MI NW of Columbia, SC	South Carolina Electric & Gas Co.	2
Surry 1 05000280	PWR	17 MI NW of Newport News, VA	Dominion Generation	2
Surry 2 05000281	PWR	17 MI NW of Newport News, VA	Dominion Generation	2
Susquehanna 1 05000387	BWR	7 MI NE of Berwick, PA	PPL Susquehanna, LLC	1
Susquehanna 2 05000388	BWR	7 MI NE of Berwick, PA	PPL Susquehanna, LLC	1
Three Mile Island 1 05000289	PWR	10 MI SE of Harrisburg, PA	Exelon Generation Co., LLC	1
Turkey Point 3 05000250	PWR	25 MI S of Miami, FL	Florida Power & Light Co.	2
Turkey Point 4 05000251	PWR	25 MI S of Miami, FL	Florida Power & Light Co.	2
Vermont Yankee 05000271	BWR	5 MI S of Brattleboro, VT	Entergy Nuclear Operations, Inc.	1
Vogtle 1 05000424	PWR	26 MI SE of Augusta, GA	Southern Nuclear Operating Co.	2
Vogtle 2 05000425	PWR	26 MI SE of Augusta, GA	Southern Nuclear Operating Co.	2
Waterford 3 05000382	PWR	20 MI W of New Orleans, LA	Entergy Nuclear Operations, Inc.	4
Watts Bar 1	PWR	10 MI S of Spring City, TN	Tennessee Valley	2

Plant Name Docket Number	Reactor Type	Location	Owner/Operator	NRC Region
05000390			Authority	
Wolf Creek 1 05000482	PWR	3.5 MI NE of Burlington, KS	Wolf Creek Nuclear Operating Corp.	4